IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Y. Kii   CONF. NO.: 3397

U.S. SERIAL NO.:   10/797,743   EXAMINER: J. Repko

FILED: March 9, 2004   GROUP: 2628

FOR: METHOD AND APPARATUS FOR HIGH-SPEED SHADOWING
USING SHADOW VOLUMES

Commissioner for Patents
P.O. Box 1450
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Sir:

RESPONSE TO OFFICE ACTION

Applicant is in receipt of the Office Action dated March 22, 2007 of the above-referenced application. Applicant responds to the Office Action as follows.

Claims 1-11 are pending in the application.

Claims 1-11 were rejected under 35 USC 101 as being directed to non-statutory subject matter. This rejection is respectfully traversed.

On page 2, paragraph 3 of the Office Action of 03/22/2007, it was alleged that claim 9 "appears to be directed to an abstract idea rather than a practical application of the idea." Also, claims 1-8 and 10 were alleged to be directed to "a computer that solely calculates a mathematical algorithm which is non-statutory subject matter" (see Office Action of 03/22/2007 at page 3, paragraph 6). Further, claims 1-11 were alleged to be directed to a "mathematical procedure ... without claiming any practical application or useful, concrete and tangible result" (see Office Action of 03/22/2007 at page 3, paragraph 7).

In response to the rejection of claim 9 under 35 USC 101, the graphic processing method recited in claim 9 has a specific and substantial utility. In particular, as recited in claim 9, graphic data for normal and shadow polygons is converted to visual-point coordinates including x-coordinates and y-coordinates and depth values. The specific and substantial utility includes converting graphic data to visual-point coordinates and depth values sorted between front-facing shadow polygons that face front and back-facing shadow polygons that face back; therefore, in accordance with the Applicant's claimed invention, graphic objects are sorted into visual-point coordinates and depth values to properly display the objects with shadow regions (see, e.g., specification at paragraphs 0106 to 0107).

The above-described specific and substantial utility is entitled to a presumption of utility (see MPEP 2107.02 III). Moreover, independent claims 1 and 4 recite subject matter similar to that recited in independent claim 9, and thus have a specific and substantial utility, for at least the reasons discussed above. Since one of ordinary skill in the art would understand that the claimed invention has a specific and substantial utility, the rejections under 35 USC 101 should be withdrawn.

Applicant also notes that independent claims 1, 4, and 9 are not drawn to a mathematical algorithm, at least because the claimed invention has the specific and substantial utility demonstrated above.

Claims 1, 3, 4, 6, and 9-11 were rejected under 35 USC 102(e) as being anticipated by U.S. Patent 6,744,430 to Shimizu. Claims 2, 5, 7, and 8 were rejected over prior art including the Shimizu reference. These rejections are respectfully traversed.

There is no teaching or suggestion in Shimizu of "obtaining a coordinate region that is positioned behind the front-facing shadow polygons and in front of the back-facing shadow polygons" as claimed.

Shimizu is directed to "an image processing method and apparatus for effecting volume representation in real time" (column 2, lines 9-11 of Shimizu).

On page 6 of the Office Action of 03/22/2007, the following sections of Shimizu were cited allegedly for teaching the claimed "hidden surface removal and shadowing processing section": column 18, lines 49-51 and column 21, lines 25-27.

Column 18, lines 49-51 of Shimizu states: "The region buffers 220-1 and 220-n store information on whether something is inside or outside a volume (region), pixel by pixel."

Column 21, lines 25-27 of Shimizu states: "The sort preprocessor (Z buffer) 110 outputs the polygon ID positioned foremost for each pixel, layer by layer."

In other words, the above sections of Shimizu merely describe that the pixels of an object can be either "inside or outside" a given volume or region on a pixel-by-pixel basis, and the polygon ID "positioned foremost" is outputted for each pixel.

Therefore, the Shimizu reference does not teach or suggest an apparatus or method in which hidden surface removal and shadow processing are performed in order <u>to obtain a coordinate region "positioned behind the front-facing shadow polygons and in front of the back-facing shadow polygons</u>," as recited in independent claims 1, 4, and 9.

It is believed the application is in condition for immediate allowance, which action is earnestly solicited.

Respectfully submitted,

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